Decision Support System for Managers
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Module – 04
Lecture – 22
Order Picking; Material Handling Equipments

Hello and welcome to "Decision Support Systems for Managers"! We are into module 4 and lecture 7; 'decision support systems for material managers'; and we till now, we have calculated how much space we require in the warehouse, where should be the warehouse location and we have come up with a very important finding mathematically, provable; proved that if you can synchronize your order patterns; how much to order you can reduce your warehouse space to a great extent.

You can reduce your warehouse quantity in the sense that quantity of products that will be stored in the warehouse you can reduce those things also to a great extent. Normally, what is done in real life is, the warehouse manager just does 2 things. One is he keeps a record of how much material is coming in, how much material is going out that is it. Somewhere somebody sitting at some place based on that data is calculating how much space you should have; ok.

Now, and then they are giving recommendations on synchronizing the demand patterns demand and supply patterns. So, somewhere down the line warehouse manager is also to come up materials manager have to come up with some of these strategies that he or she can contribute to cost reduction of the organization.

Remember keeping an analyst is not always possible for many companies. One is they come at a high cost and number 2 these resources analysts are very scarce. Analysts are very scarce in the sense that they might not be specialized for the specific functions that you are performing.

So, if this activity can be done by the materials manager it is the best. That is why materials managers need to be equipped with all the things that concern the functioning and operation of the warehouse ok. So, it is not that warehouse manager or materials manager will only keep a record of material in material out. No, it is the warehouse manager has to tell which material I should store which material I should not store; ok.

For example, my data tells that I need 100 pieces of a product per day in my warehouse. It is the warehouse manager who will tell whether there is a traffic restriction and whether I should use a small vehicle or the larger vehicle.

That will contribute to cost reduction. If a warehouse manager can tell that why can not the warehouse manager or the materials manager also predict how much material I should store in the warehouse because as I mentioned not every organization can afford a data analyst; ok.

And that data analyst also will need time to understand your business and then only can he or she give some recommendation; ok. So, you will have to be very careful and proactive in giving recommendations on the area that you are an expert in as a manager right. So, today we will do order picking, material handling equipments; right.

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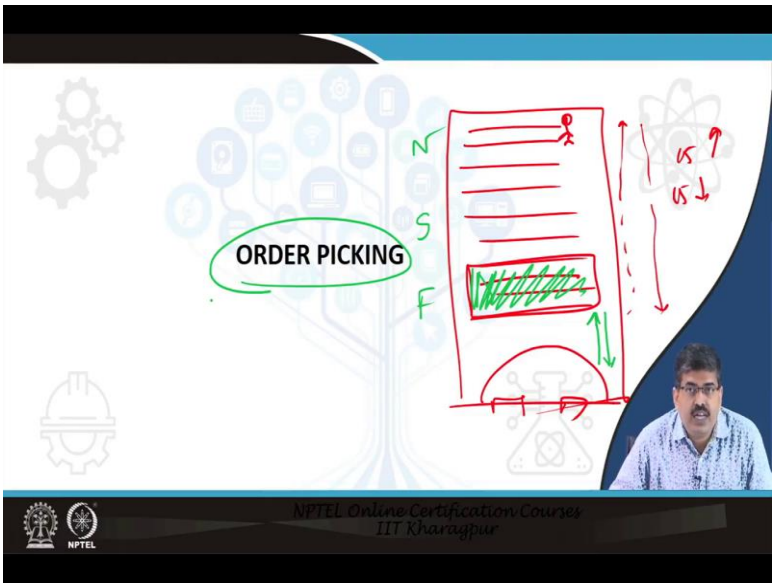

Order picking; ok. Now, it looks very simple, what is there in order picking but it is very-very important. What are the problems that can happen in order picking? See the work; that particular order that is getting picked, that is at the last end of the warehouse.

If this is a warehouse; if this is a warehouse these are the gates that material that is getting picked staging area that is here. The material that is getting picked is here. So, the worker has to walk all the way up and come down right. How much time are you losing?

Some warehouses are so big that you will require 15 minutes for going and 15 minutes for coming back.

So, you need machines that machine may not be available because it is doing some other work. So, you need forklifts. So, order picking is; look; it looks simple but it is very-very; if you can do a calculation, you can reduce cost, and reduce time.

Now, the question is, that you have just now learnt that if a material is required so much, why will this worker need to go to the end? I will keep that material here; I will keep that material here; I will keep that material here because then the worker will have to go and come back lesser distance, so lesser time. What is this? Fast moving; what is this? Slow moving; what is this? Non-moving.

So, now, you see the application of FSN fast moving, slow moving, non moving ok. So, order picking. So, for order picking you will have to arrange your materials in such a manner that it helps the organization.

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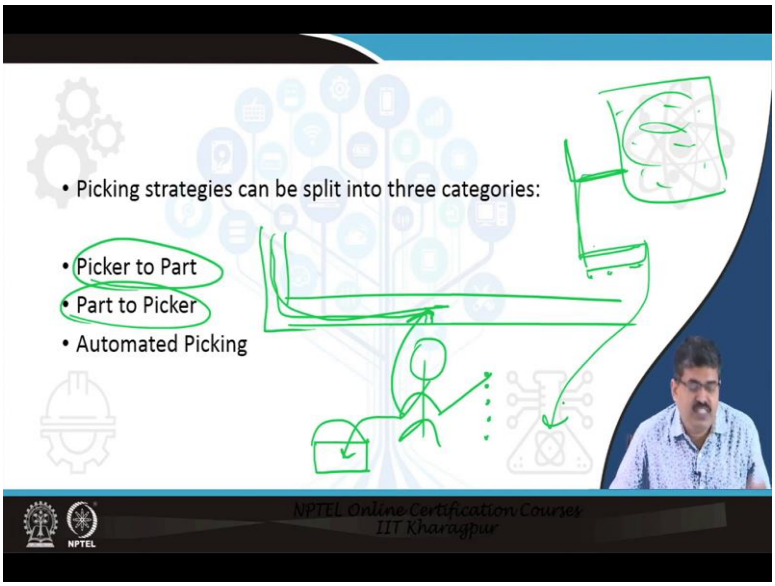

Order picking Systems. Picking strategies can be split into 3 categories picker to part, part to picker and automated picking very very simple ok. Let us see what is picker to part. Who is the picker?

The worker. So, what is the worker doing? Ok let us take another example ok. You have gone to Big Bazaar; you have gone to Big Bazaar or Spencer or more or any other giant format retail you have gone there. How do you shop? The products are there in the racks, you go pick them up, put it in your basket, go to the cash counter pay go home; right.

Who are you? You are the picker. You are picking up the products. Are the products coming to you? No, you are going to the product means you are going to the racks and you are putting them in your basket and coming back right. So, picker who you are the picker you are picking up, picker is going to the part.

So, picker to part ok. Product is the part here part. So, picker is going to the part. Next is the other way around. The part the product is coming to the picker. This happens in warehouse setting. The worker is standing here; there is a switchboard here with lot of buttons.

When you press a switchboard and there is a conveyor belt in front that product comes in through the conveyor belt. You pick up the product from this conveyor belt and put it in the basket that is here right and put it in the basket that is here. So, what has happened?

The part has come to the picker right. And the third one is automated picking system. Automated picking system is the products are there; products are there somewhere. You are sitting in your office, press a button and an automatic forklift goes there, picks up the product and brings it back to your office to the staging area right. So, this is called as automated picking.

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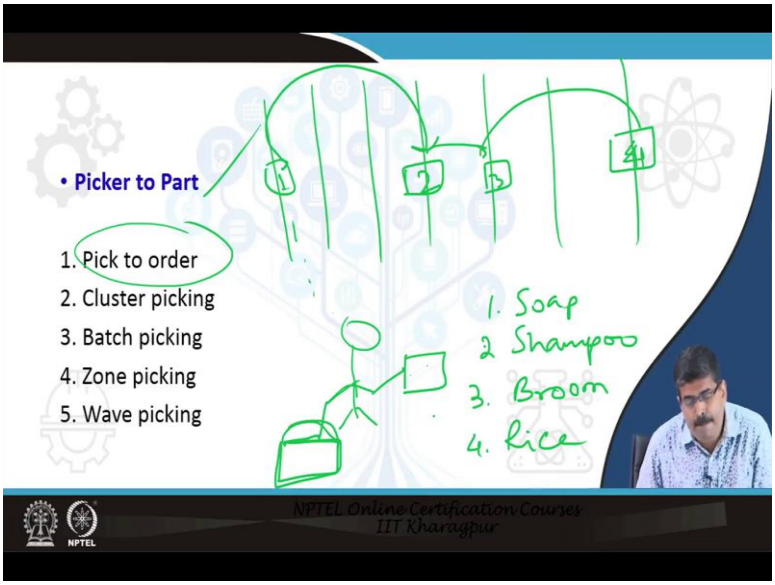

So, let us now go and check this up what are these things right. Picker to part, pick to order an order has come you pick it ok. So, what I do? Here is my warehouse these are what? These are all the racks ok. Who am I? I am a worker with a list and with a basket. So, what do I do?

Basically, it is a trolley ok. What do I do? I have a list that list has soap, shampoo, broom and rice. So, what do I do? I go, pick up soap from here. Then again I go pick up shampoo from here, then again I go pick up broom from here and then again I go pick up rice from here right rice from here.

So, what have I done? I have moved the whole warehouse; I have moved around the entire warehouse right. I moved around the entire warehouse spend time, but what has happened. I have picked up every product. I have picked up every product and come back. Method 1 that is pick to order. There has been an order and I am picking as per the order list ok. Let us go to the next one, cluster picking; ok.

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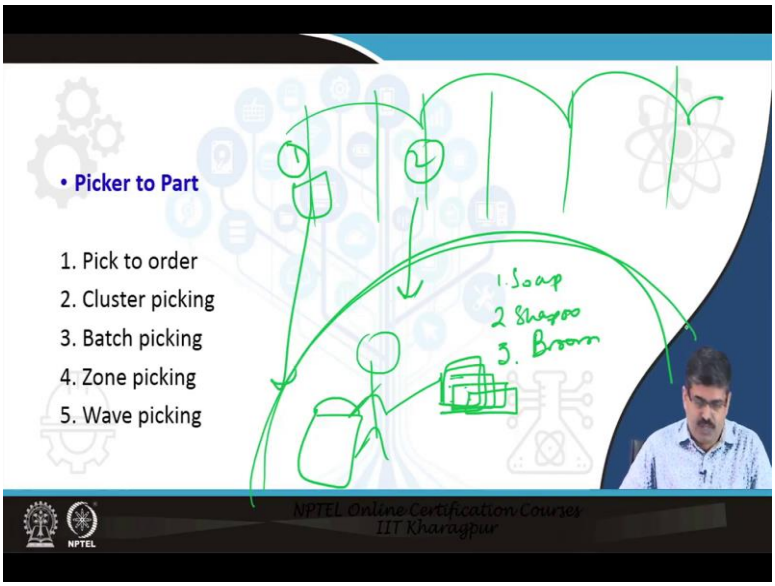

Again rack; ok. I have a picking list. Same thing soaps, shampoos, etcetera. But, this time what is happening same thing soap, shampoo and broom, but what is happening is I pick up only soap at one go ok. So, I do not have 1 list I do not have 1 list. I have 3, 4, 5 list with me. So, what I do? I check up whether there is soap in this list number 1, whether there is soap in list number 2, whether there is soap in list number 3 and list number 4.

So, when I go here to the soap counter I pick up soap for all the lists and come back. Some another worker goes and picks up all the shampoos from all the lists and come back. Then what is happen at the central space? They are sorted as per the wholesalers order wholesaler 1 has order soap, shampoo and broom.

So, my soap, his shampoo and his broom is put together, clubbed and put in a packet. Wholesaler 2 has ordered soap and broom only. They are separately clapped and put in a pocket packet. What is the advantage of this method? That I do not keep on hopping around from one end to the other.

I do not keep on hopping around from here to here to here and spend my time. I pick up only one and come back. What are the problems? The problem is whatever time I have saved there another not equal lesser the lesser time is spent here amalgamating and putting them into proper packets dealers and distributors products in proper packets.

So, that part is lost. So, that part time is lost. So, this is one thing. Second things the second problem that happens is while putting things together dealer A's product may go to dealer B and dealer B's product may go to dealer C; right.

Not actually happens like that, but then there is a possibility right. So, cluster picking has this problem. So, this batch picking, zone picking, wave picking are all similar descriptions under different names they come clear. There is slight difference, but then you can ignore it.

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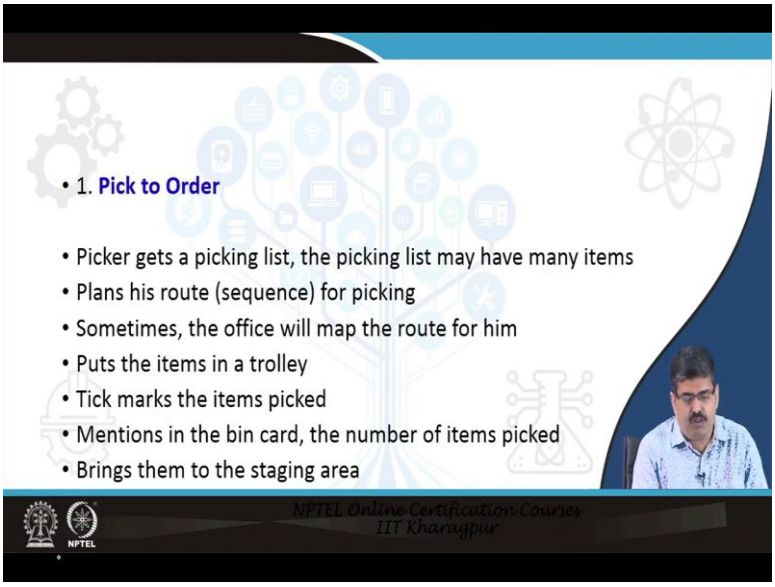

This is the description whatever I have mentioned is just an description.

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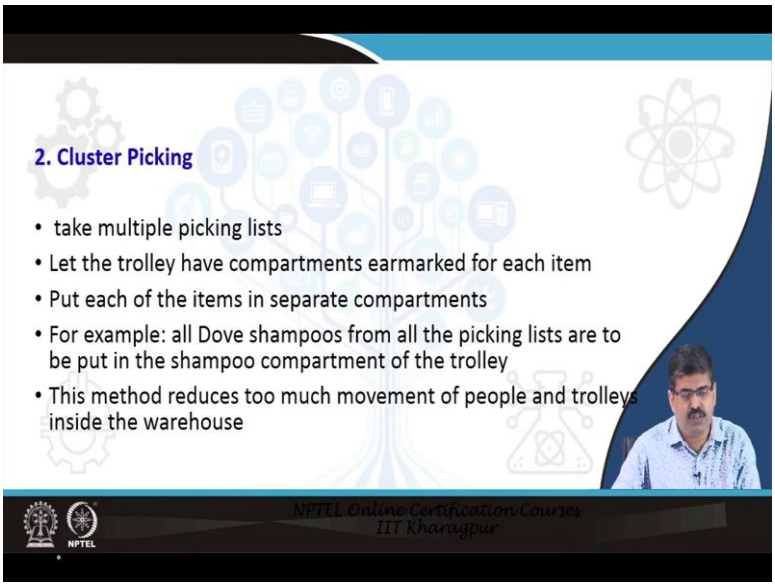

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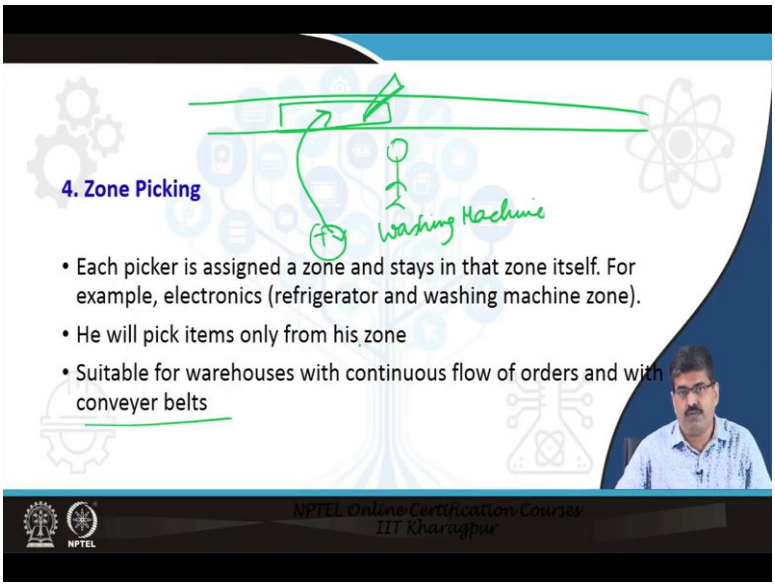

Now, the zone picking let me spend a few minutes. Each picker is assigned a zone and stays in that zone itself. Electronics for example, refrigerator and washing machine zone he will pick items only from his zone suitable for warehouses with continuous flow of orders and with conveyor belts; ok.

What is this let us explain. I am standing here and behind me is what TV and washing machine; ok. Now here is a conveyor belt in front. So, there is a big box that comes up here with a picking list.

So, the conveyor belt is moving. So, moment it comes to me I press the button I press the button and the belt stops ok. I press the button and the belt stops. I pick the picking list, check up whether there is anything that can be picked up from my zone.

If no what I will do? I will press the button again the belt will go with the bucket. If there is something say a TV I will put the TV in that box. Now, press the button now press the button and the belt goes. So, worker does not move away from his zone rather the conveyor belt keeps on moving; ok.

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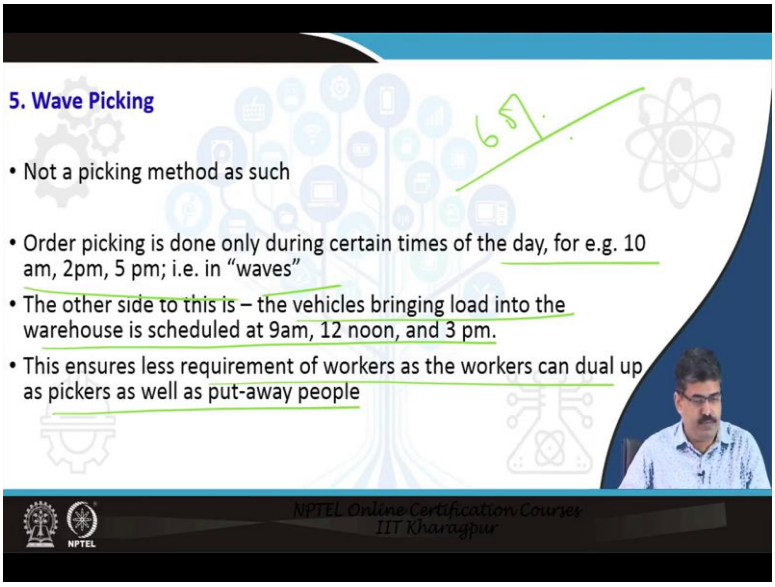

Wave picking not a picking method as such order picking is done only during certain times of the day. For example, 10 AM, 2 PM sorry for example, 10 AM 2 PM 5 PM. For example, 10, 2, 5 that is in waves in this sometimes in slots or slots we can also say. Other side to this is the vehicle bringing load into the warehouse is scheduled at 9, 12, 3. So, what is done is at 9 the vehicle will come, at 10 the picking will start.

So, the same vehicle can unload moment it finishes unloading it goes away. This ensures less requirement of workers as the workers can dual up as the picker as well as the put away people. And I will say that at least 60 percent of warehouses which does not have that much of work throughout the day, they follow this, 'wave picking'.

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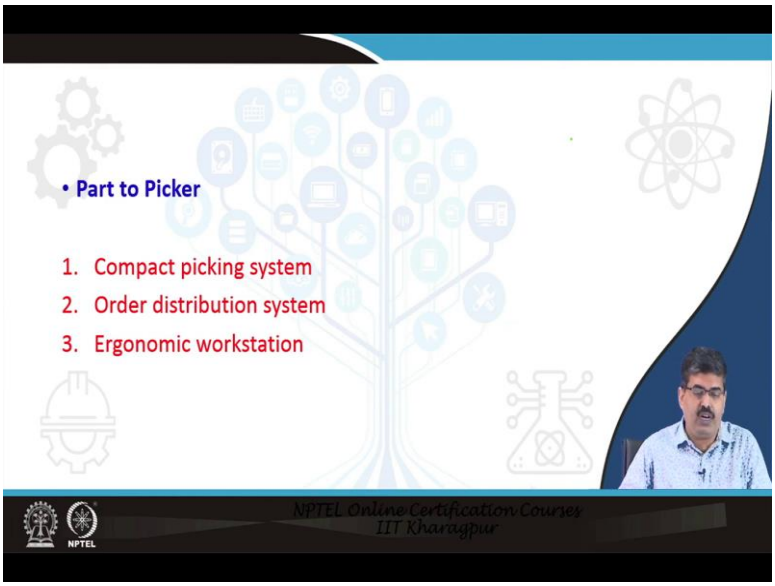

Part to picker. This was picker to part it is coming to the picker. Compact picking system, order distribution system and ergonomic workstation; ok.

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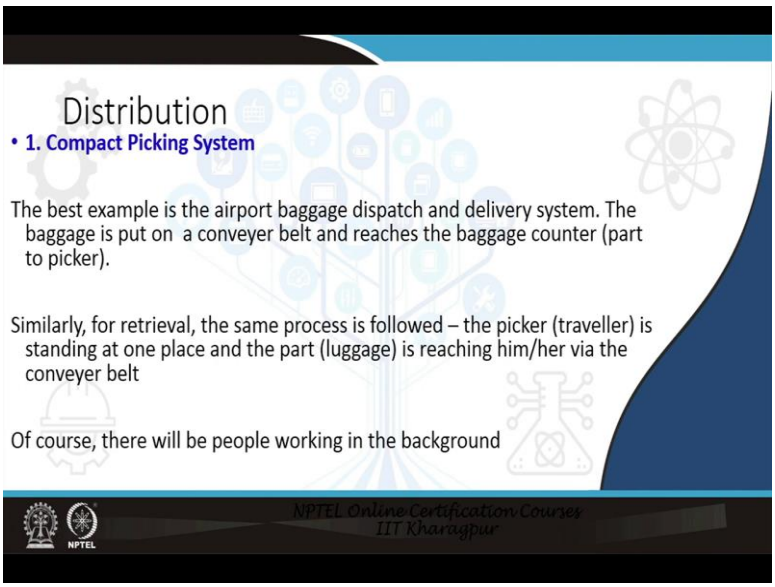

Compact picking system best example is airport baggage. Compact picking system best example is the airport baggage dispatch and delivery system. The baggage is put in a conveyor belt and reaches the baggage counter that is part is coming to the picker. Similarly, for retrieval the same process is followed. The picker or the traveler is standing at one place and the part that is the luggage is reaching him or –via- the

conveyor belt of course, there will be people working in the background. This is a compact picking system that is that is normally it cannot go anywhere it cannot go anywhere right. So, this is the compact picking system.

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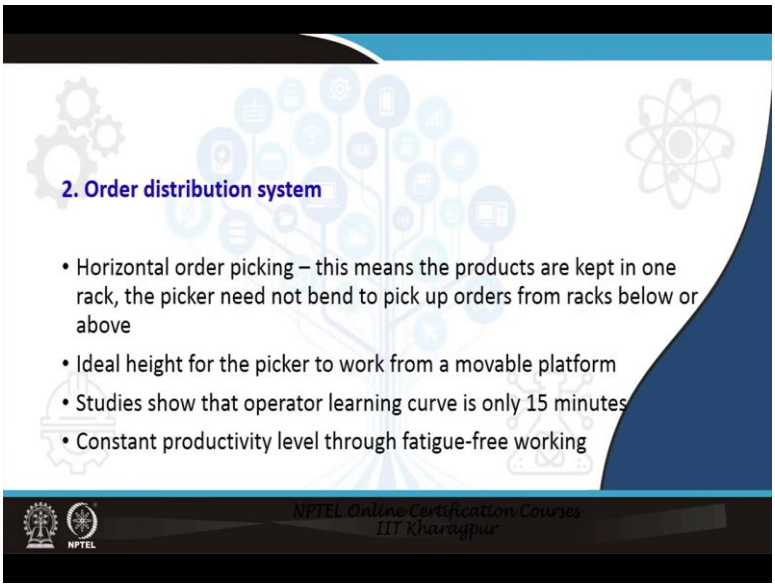

Now, order distribution system horizontal order picking this means that the products are kept in one rack. The picker need not bend to pick up orders from racks below or above. Horizontal picking system this means the products are kept in one rack only and the picker need not bend to pick up orders from the racks below or above. Ideal height for the picker to work from a movable platform.

Studies show that operator's learning curve is only 15 minutes and constant productivity level through fatigue-free working. This is a very beautiful thing that is there is let us explain it. The products are in one rack only products are there in only one rack. So, any order that comes in the worker need not search up and down rack below rack above it is there in one rack.

So, you can quickly glance and what we are seeing is the learning curve is only 15 minutes that if the worker works for 15 minutes he knows pretty much well what is he supposed to do, what is expected of him and it works. Now, what is the disadvantage? Space required is much-much more because you are losing out on the number of racks; ok; constant productivity level through fatigue-free working.

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Now, this ergonomic workstations. It is a combination of the previous 2 methods compact picking and order distribution systems. All over the world today we are looking at ergonomic workstations all over the world.

There is so much of work related so much of work related problems in terms of ergonomic design, etcetera that all over the world there is tremendous focus on ergonomic workstations. It is now a matter of great concern that people who are working over computer platforms for 10 12 hours a day. They are developing problems with the hand muscles, hand contraction, hand posturing they are developing lot of problems.

People who are working on a desk job that is they are sitting and working for 10 12 hours a day they are developing back pain and the problem is plaguing. This problem is just like increasing every day people who are working in front of the computer screen they are developing eyes eye problems the vision problem.

So, these are problems that are coming up. What are companies doing? Companies are particularly if you look at the Toyota production system which again is a great example of to some extent though it was not meant in that way, but to some extent ergonomic workstations they mapped workers.

Where is this worker working? What trade? What function? What is the height of the worker? Ok. Is the worker doing a standing job or a sitting job? Is the worker sitting and

doing? Accordingly they are adjusting the height of the workstations so that the worker does not feel fatigued; ok.

So, these are issues that are coping up. For people working in the it sector there is an there is an alarm and that alarm will prompt the worker to stop work, prompt the employee to stop work and go out and take a stroll and come back just to stretch the back so that back pain does not come back. But, that was not happening workers were ignoring that message they were not going out. They were still working in the workstation.

So, what happened? New thing came up; after they slated slot of say, half an hour or may be 45 minutes or 1 hour, the machine would not work, it will auto stop. When it auto stops, then you are forced to move up, it will auto stop for 5 minutes. So, ergonomic workstations is very-very important particularly for warehouses; as materials manager, you will see workers bending down, moving up, lifting a load.

Have you done studies on what angle exactly has the worker to bend down and lift a load? Is the worker facing some problems with the back? I remember once I was at a doctor's clinic for treatment of my father and there a boy had come 21 22 years old and he was not able to move his neck properly and this doctor had a chamber wherein like every patient could listen and can hear what the other patients problem was.

So, this doctor was asking this boy what is the problem. He said I am not able to move my neck doctor, why? What happened? He said I was carrying heavy load on my shoulder and moving up the stairs 2 storey's level 1, level 2.

Every day 7 8 times I was putting load on one shoulder only and moving up because that was the nature of my job. Then the doctor asked can you did you not ever try both the shoulders see I was understanding the, but the doctor was asking was basically he was trying to understand that was the load being equally distributed on both the shoulders.

This boy said no the nature of the product was such that it could be held only in one shoulder. Then the doctor asked which shoulder would you take. He said my right shoulder. Doctor asked would you not shuffle it. Next time do not we did not take it in the left shoulder. He said no I would always take it in a right shoulder. So, what has

happened? May be some nerve got disturbed; may be some nerve got disturbed and that is why, he was not able to move; he was not able to move his shoulder properly.

So, this is so ergonomic workstation. As a manager employee is your responsibility and you will have to understand do motion studies, do time studies. Let us go back to the days of Taylor and Fayol.

Do motion studies and see what is beneficial for your employees and if it is beneficial for your employees be rest assured that your productivity will increase. Just to save a little bit of cost you do some activity, but if you spend that on understanding and building up ergonomic workplaces you will see that productivity will increase and will offset the additional cost that you had spent.

So, you have to be very careful on these things. These are that is where an organization stands apart from another organization. I remember one person is in connection with this ergonomic workstation.

On the table, he would have another height and above that he would put his laptop and work and his hand will always be like this and he was working he was working. What happened? After some time pain here pain here. Ultimately, he had to discard and stopped using laptop at all. So, ergonomic workstations; clear!

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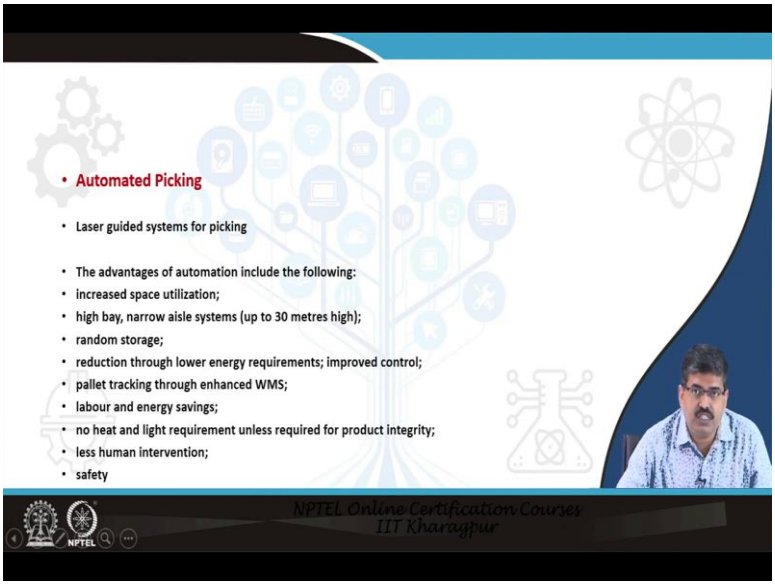

So, these are basically the essentials of this order picking etcetera and automated picking we have mentioned laser guided picking systems as we. Right at the beginning only we mentioned you a laser will point the fork lift automated forklift will go pick it up bring it back and put it in the stitching area. These are things that are being done in modern warehouses all aimed at 6 sigma; ok.

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So, material handling equipment shall quickly glance through hm. These are some we will be regularly telling out forklift and forklift. These are basically the forklifts. These

things move up; these things move up and pick up the products; ok. These are all forklifts. These are all different these hand trolleys. These can rotate just like a wheel of a car ok. These are again you can you can increase the height you can increase the height. So, these are battery operated vehicle. Remember in a warehouse no electric vehicles are allowed.

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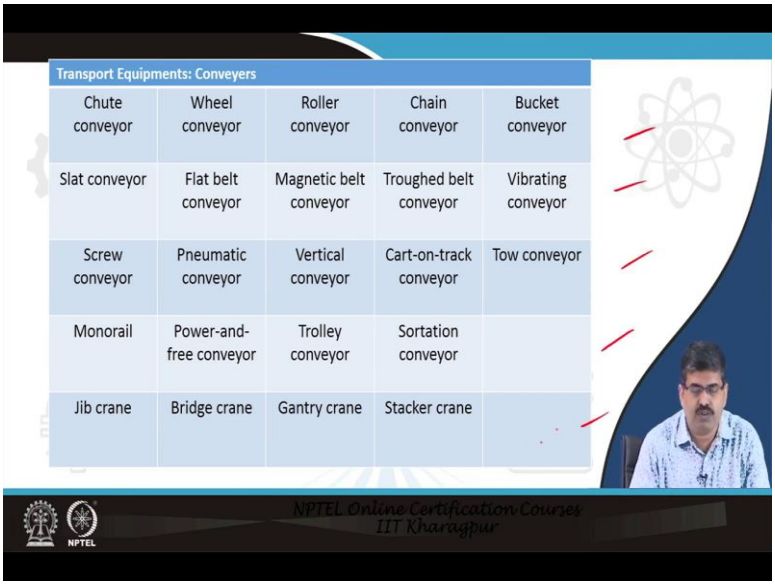

So, just can just get an equipment conveyor belt. This is just an nomenclature. What are the types of conveyors? Etcetera ok. This is just for your knowledge, nothing beyond [FL].

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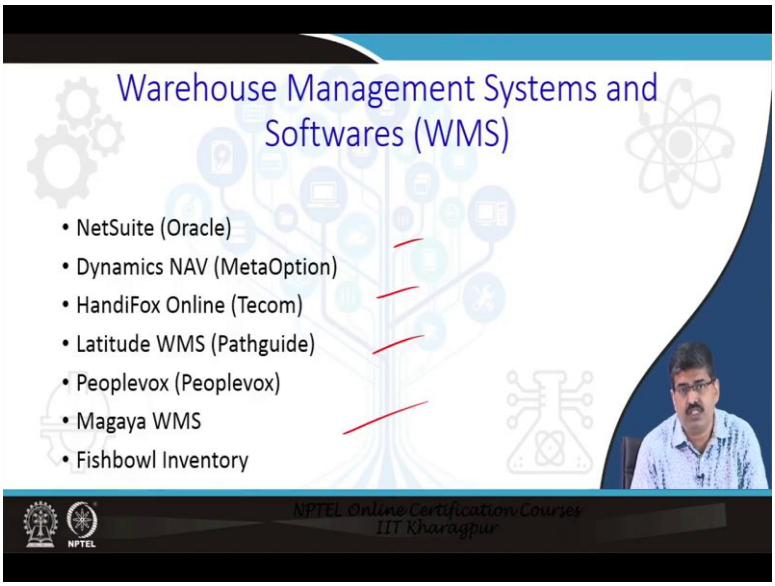

Now, these are some examples of warehouse management softwares which are now being used by different organizations for warehouse management systems; ok.

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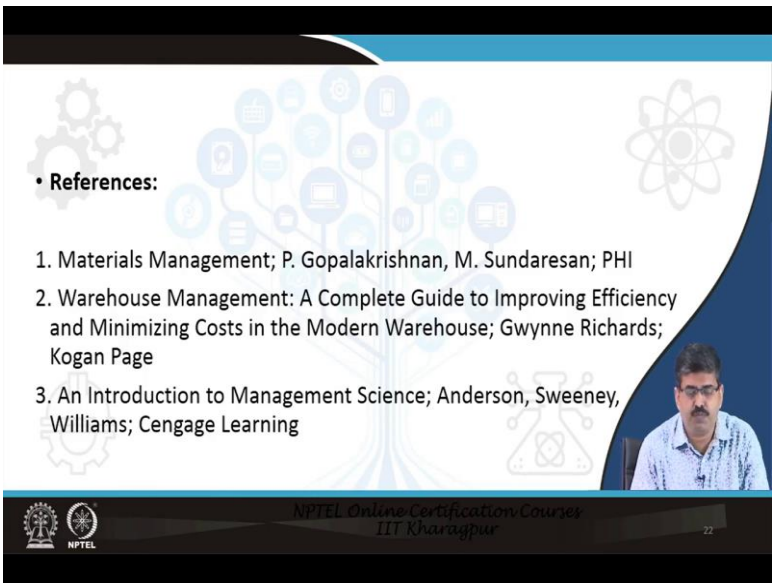

So, I think this is pretty much for this module. These are the references; ok.

Thank you!